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EXAMINER	
GRAHAM, ANDREW R	
ART UNIT	**PAPER NUMBER**
2644	

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/826,503	CARTER, CHARLES H.	
	Examiner	Art Unit	
	Andrew Graham	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objection

1. The amendment made to **Claim 5** in view of the previous objection is sufficient to overcome the grounds of previous said objection. Accordingly, the relevant objections thereto is hereby withdrawn.

Response to Arguments

2. Applicant's arguments filed 6/24/05 have been fully considered but they are not persuasive.

On page 7, lines 13-14, the applicant has stated, "The microphone of Richardson is used as feedback to monitor a response not for calibration of the speaker". The examiner respectfully disagrees. The microphone (13) of Richardson provides an input to DSP (50) (col. 4, lines 9-12). Based on this input, the factors are developed for adjusting the gain and frequency response of a signal to ensure maximum intelligibility of the signal when output through the speaker, while compensating for the acoustic transducer characteristics (col. 4, lines 12-20, 40-43, 50-53). Such adjustment, the purpose of which is to optimize the acoustic performance of the specific loudspeaker system at all ambient noise levels, is equivalent to 'calibrating the speaker', so far as such calibration is represented in the pertinent claim language of Claim 8.

On page 8, lines 1-2, the applicant has stated, "Applicant's claim the use of the portable communication device's internal microphone, as claimed in claim 8. No additional test microphone is

needed in Applicant's invention". The examiner respectfully notes, however, that the pertinent claim language, "a microphone in the portable communications device" does not provide distinction from element (13) of Richardson, which is disclosed as being housed in a single housing (col. 2, lines 16-17). Richardson further teaches that such a microphone may be used as the transmitter input transducer (col. 3, lines 26-29).

On page 8, lines 3-5, the applicant has stated, "The Powter reference is based entirely on stimulating a microphone with noise and measuring a frequency response of the microphone - not calibrating the microphone or the speaker". The examiner respectfully notes, however, that measuring a frequency response is part of the process of speaker calibration in the system of Richardson (determining appropriate gains for different frequencies during the production of the training sequence, col. 4, lines 12-23), and as such, the measuring of a frequency response in Powter, as is acknowledged by the applicant, is relevant to the teachings of Richardson and at least makes obvious the particular limitations of Claim 8 for which it was relied upon in the rejections of the previous office action. Further, it is well-established that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

On page 8, line 5, the applicant has stated, "Powter uses an external noise source". The examiner respectfully notes, however, that Richardson discloses that all of the components for calibrating a

transducer response, including the component that generates the training audio sequence, may be integrated into the same housing (col. 2, lines 16-17). A reasonable expectation of success is based on the fact that, in light of the single housing taught by Richardson, Powter teaches that the pseudo-random noise generator is part of an acoustic generator that is physically adapted to seal on the casing of the microphone to which it is applied, in order to avoid problems in accurately positioning the involved components relative to each other (col. 1, lines 34-46; col. 2, lines 49-62). As such, the components in the system of Powter are physically conjoined during use, as are the components in the system of Richardson by virtue of the signal housing of the device. In view of these responses and the analogous components of Richardson, such as the transducers and the generation of audio sequences, it is respectfully submitted that Powter and Richardson are readily combinable produce that which is claimed by the applicant in Claim 8.

On page 8, lines 13-14, the applicant has stated, "neither Richardson nor Powter optimize a microphone". The examiner respectfully submits, however, that so far as any such 'optimization of a microphone' is represented in the steps of Claim 5, such 'optimization' is made obvious by the teachings of Richardson in view of Powter and Wong. The steps of the method claimed in Claim 5 were addressed in the previous office action, as is repeated below. This response also applies to the applicant's remarks made on lines 15-17

of page 9, line 18 of page - line 1 of page 10, and lines 7-8 of page 10.

On page 8, lines 17-18, the applicant has stated, "Wong requires a plurality of auxiliary input and output signal devices as opposed to devices 'within' the portable communication device". The examiner respectfully notes, however, that Richardson clearly teaches that the disclosed device, which would include microphone (13), is housed within a single device (col. 2, lines 16-17) and thus teaches a microphone "within the portable communication device".

On page 10, lines 8-10, the applicant has stated, "Wong requires the use of a reference audio response corresponding to an ideal response for the accessory device as described in column 4. lines 29-30" and "No such ideal response is used in Applicant's invention". The examiner respectfully disagrees. The ideal response of Wong clearly corresponds to a reference audio response, as is evidenced in the passage of Wong cited by the applicant. The applicant's specification describes a 'desired signal' (d) to which an input is compared (y) to derive an error signal (e)(page 4, lines 4-13 of specification as originally filed). As utilized in the system, the 'desired' signal is analogous to the reference signal of Wong, which as noted in Wong, corresponds to an ideal response. Thus, in the wording employed by Wong, an 'ideal response' is used in Applicant's invention.

As the applicant's remarks have been addressed in the response listed above, the rejections of the pending claims have been reviewed and are respectively maintained herein, as is repeated below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson (USPN 5771297) in view of Powter et al (USPN 3912880).

Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies.

Regarding **Claim 8**, Richardson teaches:

A method of acoustic transducer calibration (function of filter 8, col. 3, lines 38-41) for optimizing the frequency response and gain of an internal speaker (17)(receives output of 8; col. 4, lines 23-25 and 50-53) located within a portable communication device (col. 2, lines 16-17; col. 3, lines 26-29) comprising the steps of:

generating a source ("training audio sequence") from at least one digital signal processor (50) located in the portable communications device (col. 3, lines 66-67; col. 4, lines 1-2);

providing the acoustic pseudo random noise to the internal speaker (12)(col. 4, lines 2-4);

directing the acoustic pseudo random noise from the internal speaker to a microphone in the portable communications device (col. 4, lines 9-10);

porting the output of the internal speaker to the at least one digital signal processor (col. 2, lines 10-11; Figure 3);

comparing (function of 15) the source with an output of the at least one digital signal processor (col. 2, lines 7-14; col. 4, lines 10-17); and

adjusting a plurality of coefficients in the at least one digital signal processor based upon differences in the source and the output of the at least one digital signal processor (col. 4, lines 12-20) to produce an optimized internal speaker output for the portable communications device (col. 4, lines 50-53).

However, Richardson does not clearly specify

- that the training audio sequence is an acoustic pseudo random noise

Powter discloses an acoustic measurement system that involves the generation of a pseudo random bit sequence that is converted to an audio signal.

Specifically regarding **Claim 8**, Powter teaches:

generating a source of acoustic pseudo random noise (col. 3, lines 11-31)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to utilize a pseudo random sequence generated signal, such as generated in the system of Powter, for the training sequence associated with an embodiment of the system of Richardson. The motivation behind such a modification would have been that such a pseudo random sequence would have provided a single, stable training signal with plurality of represented frequencies for the frequency based comparison of the system of Richardson that avoids the necessity of repeated scans of the acoustic spectrum.

4. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Powter as applied above, and in further view of Wong et al (USPN 5881103). Hereafter, "Wong et al" will be referred to as "Wong".

As detailed above, Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies. Powter discloses an acoustic measurement system that involves the generation of a pseudo random bit sequence that is converted to an audio signal.

Specifically regarding **Claim 5**, Richardson in view of Powter teaches:

A method of acoustic transducer calibration (function of filter 8, col. 3, lines 38-41 of Richardson) for tuning an internal microphone and internal speaker (12,13 of Richardson)(12 receives output of 8, based on frequency response of 13, so far as frequency response of 13 influences comparison by 50 of input signal, tuning of 50 for storage in 51 is done according to 13 as well as 12; col. 4, lines 23-25 and 50-53 of Richardson) in a portable two-way radio (col. 2, lines 16-17; col. 3, lines 26-29 of Richardson) without the use of test equipment (device in single housing, col. 2, lines 16-17) comprising the steps of:

supplying a source of pseudo random noise from at least one digital signal processor (at least part of circuitry of 50)(col. 4, lines 2-4 of Richardson in view of type of sequence of Powter, col. 3, lines 11-31 of Powter);

directing the compensated pseudo random noise signal to a the internal microphone associated with the portable two-way radio (col. 4, lines 9-10);

filtering the output of the internal microphone to provide a compensated microphone signal (function of 14, Figure 3; col. 3, lines 7-10 and 34-36 of Richardson);

supplying the compensated microphone signal to the at least one digital signal processor (col. 3, lines 56-59 of Richardson);

comparing the output of the source of pseudo random noise (from 14) with an output of the at least one digital signal processor (col. 2, lines 10-14; col. 4, lines 9-12 of Richardson);

compensating a plurality of filter coefficients in the at least one digital signal processor (stored in 51) based upon differences in the source of the pseudo random noise and an output of the at least one digital signal processor (col. 4, lines 12-20 of Richardson); and

stopping the source of pseudo random noise (col. 4, lines 20-22 of Richardson); and

returning the portable two-way radio to an operational mode (col. 4, lines 22-23 of Richardson).

Richardson also notes that several transducers may be used with a device (col. 5, lines 5-9).

Richardson in view of Powter does not clearly specify:

- filtering the pseudo random noise to provide a compensated pseudo random noise signal;
- supplying the compensated pseudo random noise signal to a speaker external to the portable two-way radio;

Wong discloses a method and system for adjusting the signal processing of a portable communications devices which is connected to a plurality of auxiliary input and output signal devices.

Specifically regarding **Claim 5**, Wong teaches:

filtering the pseudo random noise ("sample signal") to provide a compensated pseudo random noise signal (application of sample signal to accessory, such as 130, the path of which comprises filter 454; col. 3, lines 62-66; col. 4, lines 31-39);

supplying the compensated pseudo random noise signal (output of 454) to a speaker external (451) to the portable two-way radio (110) (col. 3, lines 62-67; col. 4, lines 1-3).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the accessory speaker of Wong as one of the transducers utilized in a portable communications device embodiment of the teachings of Richardson in view of Powter. The teachings of Richardson make an allowance for additional transducers, as is noted above. The motivation behind the use of such a particular additional accessory such as that taught by Wong, would have been the inclusion of an output device with a configuration or function not included in the communication device. The accessory disclosed by Wong would have also enabled such additional function or configuration to be adapted to the collective equalization parameters of the input and output devices used in the system.

5. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Powter and Wong as applied above, and in further view of Eatwell et al (USPN 5481615). Hereafter, "Eatwell et al" will be referred to as "Eatwell".

As detailed above, Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies. Powter discloses an acoustic measurement

system that involves the generation of a pseudo random bit sequence that is converted to an audio signal. Wong discloses a method and system for adjusting the signal processing of a portable communications devices which is connected to a plurality of auxiliary input and output signal devices.

While the system of Richardson discloses the comparison of an initially output signal and a received version of the same output signal, particular details regarding the timing of the involved, compared signals is not provided.

As such, Richardson in view of Powter and Wong do not clearly specify:

delaying (function of 4) the source of pseudo random noise compared with the output of the at least one digital signal processor (col. 3, lines 62-67; col. 4, lines 1-7, in view of the output of a test signal as particularly taught by Richardson).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include at least a delay component between the input of the amplifier (7) and the comparison circuit (15) of the system of Richardson in view of Powter and Wong. The motivation behind such a modification would have been that such a delay would have provided compensation for the non-ideal response of the test signal reception path and components of the system of Richardson in view of Powter and Wong.

6. **Claims 7, 1, 3, 4,** are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Powter and Wong as applied above, and in further view of Rapaich (USPN 4631749).

As detailed above, Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies. Powter discloses an acoustic measurement system that involves the generation of a pseudo random bit sequence that is converted to an audio signal. Wong discloses a method and system for adjusting the signal processing of a portable communications devices which is connected to a plurality of auxiliary input and output signal devices.

Specifically regarding **Claim 7**, please refer above to the rejection of the similar limitations of Claims 5 and 8 regarding the "method", "generating", "providing", "directing", "porting", and "comparing".

Richardson particularly teaches:

> adjusting a plurality of coefficients (stored in 51) in the at least one digital signal processor based upon differences in the acoustic pseudo random noise and the output of the at least one digital signal processor (col. 4, lines 12-20)

However, Richardson in view of Powter and Wong do not specify:

- that the adjusting of the coefficients produces an optimized microphone output for the portable communications device.

Rapaich teaches system for compensating an input microphone associated with frequency analysis components.

Specifically regarding **Claim 7**, Rapaich teaches:

adjusting a plurality of coefficients (stored in 52) in the at least one digital signal processor based upon differences in the acoustic pseudo random noise and the output of the at least one digital signal processor (col. 7, lines 39-68, in view of Richardson) to produce an optimized microphone output for the portable communications device (col. 5, lines 30-47).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to associate coefficients in the DSP in the system of Richardson in view of Powter and Wong with the filtering characteristics of the microphone input filter (14), as is suggested by the teachings of Rapaich. To one of ordinary skill in the art at the time the invention was made, it would have been obvious to make the characteristics associated with the input filter (14) of Richardson programmable in order to compensate for the non-linear operating characteristics of the input microphone. Such compensation would have at least enabled the frequency analysis, if not the other processing associated with the microphone input, performed by the system of Richardson in view of Powter and Wong, to be performed according to detected frequency characteristics of a signal not degraded by the input components.

Regarding **Claim 1**, Richardson in view of Powter, Wong, and Rapaich teaches:

A method for acoustic transducer calibration in a portable communications device (function of filter 8, col. 3, lines 38-41; col. 2, lines 16-17; col. 3, lines 26-29 of Richardson) comprising the steps of:

providing a source of pseudo random acoustical noise (col. 4, lines 2-4 of Richardson in view of col. 3, lines 11-31 of Powter) to an characterized external speaker source separate from the portable communications device (application of sample signal; col. 4, lines 33-35 of Wong, in view of signal output of Richardson, col. 4, lines 2-4)

directing the pseudo random acoustical noise to an input of a an internal microphone used with the portable communications device (col. 4, lines 9-12 of Richardson),

adjusting first coefficients in at least one digital signal processor connected to the internal microphone for a desired microphone frequency response based upon the input of pseudo random acoustical noise (col. 7, lines 29-59 of Rapaich);

discontinuing the source of pseudo random acoustical noise from the external speaker source (col. 4, lines 2-23 of Richardson in view of col. 4, lines 37-41 of Wong),

applying the source of pseudo random acoustical noise to an internal speaker source in the portable communications device (col. 4, lines 2-4 of Richardson in view of col. 5, lines 1-8 of Richardson),

increasing the amplitude of the pseudo random acoustic noise such that it can be detected by the internal microphone (col. 2, lines 22-30);

adjusting second coefficients in the at least one digital signal processor for a desired internal speaker frequency response based upon the input of the pseudo random acoustical noise (col. 2, lines 25-33; col. 4, lines 12-20 and 40-43 of Richardson);

returning the portable communications device to an operational mode (col. 4, lines 23-25 of Richardson), and

utilizing a filter (454) between the source of pseudo random acoustical noise (generated by a DSP, such as in Richardson, col. 4, lines 2-4) and the external speaker (451) to compensate for irregularities in the frequency response of the external speaker (col. 3, lines 62-67; col. 4, lines 1-3 and 45-49 of Wong in view of the teaching that the comparison of values by 15 in Richardson is based on signals output by filter 8; col. 2, lines 61-66 and col. 3, lines 30-43, Figure 3).

Regarding **Claim 3**, Richardson particularly teaches:

comparing (function of 15) the output of the at least one digital signal processor (input to 7) with an optimal acoustic signal from the output of the pseudo random acoustic noise (received by 13) to provide an error signal (outputs of 30,31, Figure 3) for adjusting the coefficients (stored in 51) of the at least one digital signal processor (50)(col. 2, lines 18-21; col. 3, lines 30-43; col. 4, lines 9-20; Figures 3 and 4).

Regarding **Claim 4**, Richardson particularly teaches:

wherein the source of pseudo random noise is from the at least one digital signal processor (col. 4, lines 2-8).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 703-308-6729. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Andrew Graham
Examiner
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ag
September 2, 2005

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